In the claims:

1. (Currently Amended) A system for reconstructing ~~constructing an~~ a three dimensional (3D) image of at ~~a~~least a portion of radioactivity emitting source in a system-of-coordinates, the system comprising:

a radioactive emission probe ~~of a~~ set to collect a plurality of radiation detections at a plurality of positions in different planes around the radioactivity emitting source ~~variable course motion~~;

a position tracking system, being in communication with the radioactive emission probe and configured for tracking a position of the probe in the system-of-coordinates; and

a data processor which receives a plurality of image data inputs in a first resolution ~~from the position tracking system and~~ from the radioactive emission probe, said image data inputs being of the radioactivity emitting source in the system-of-coordinates using ~~a~~ said plurality of radiation detections received from the probe, said data processor receiving ~~and a~~ said plurality of positions of the probe ~~during said detections as received~~ from the position tracking system, said data processor processing said data inputs to create ~~an~~ a 3D image of said portion in a second resolution higher than said first resolution;

wherein said data processor iteratively reconstructs said 3D image from said plurality of radiation detections according to said plurality of positions.

2. (Previously Presented) The system of claim 1, wherein the radioactive emission probe is configured for free-hand scanning.

3. (Previously Presented) The system of claim 1, wherein the radioactive emission probe is configured for movement within a body lumen.

4. (Previously Presented) The system of claim 1, wherein the radioactive emission probe is configured for insertion via an endoscope through a trocar valve.

5. (Previously Presented) The system of claim 1, wherein the radioactive emission probe is configured for movement on a linkage system.

6. (Previously Presented) The system of claim 1, wherein the data processor is further configured for receiving said image data inputs from a wide-aperture collimator.

7. (Previously presented) The system of claim 1, wherein the data processor is further configured to utilize an image acquisition and reconstruction algorithm, based on wide-aperture collimation—-deconvolution algorithms, for image resolution enhancement.

8. (Previously Presented) The system of claim 1, wherein the radioactive emission probe comprises a wide-bore-collimator probe.

9. (Previously Presented) The system of claim 1, wherein the radioactive emission probe is a wide-angle collimator probe.

10. (Previously Presented) The system of claim 1, wherein the radioactive emission probe comprises a square collimator probe.

11. (Original) The system of claim 1, wherein the radioactive emission probe includes a single-pixel radiation detector and a single collimator.

12. (Original) The system of claim 1, wherein the radioactive emission probe includes a multi-pixel radiation detector and a single collimator.

13. (Previously Presented) The system of claim 1, wherein the radioactive emission probe comprises a grid collimator probe, having a plurality of collimator cells.

14. (Original) The system of claim 13, wherein each of the collimator cells includes a single pixel.

15. (Original) The system of claim 13, wherein each of the collimator cells includes a plurality of pixels.

16. (Original) The system of claim 1, wherein the radioactive emission probe includes at least two radiation detectors, each with a dedicated collimator.

17. (Original) The system of claim 16, wherein the dedicated collimators are not parallel to each other.

18. (Previously presented) The system of claim 1, wherein the radioactive emission probe is selected from the group consisting of a narrow-angle radioactive emission probe, a wide-angle radiation emission detector, a plurality of individual narrow angle radiation emission detectors, a spatially sensitive, pixelated, radioactivity detector, a Compton gamma probe, a tube collimator, a detector sensitive to gamma radiation, a detector sensitive to beta radiation, a detector sensitive to positron radiation, a detector sensitive to alpha radiation, and a combination thereof.

19. (Previously presented) The system of claim 1, wherein the radioactive emission probe is further configured to follow a three dimensional surface which defines body curvatures of a body, to define the position of the radioactivity-emitting source with respect to an outer surface of the body and to create a three dimensional map of both the radioactivity-emitting source and the body.

20. (Previously Presented) The system of claim 19, configured for visual co-presentation of the radioactive emission probe.

21. (Currently Amended) The system of claim 1, configured for generating ~~an~~ a 3D image of counting rate as a function of position of the radioactive emission probe, the

3D image of counting rate depicting the radioactivity-emitting source and selected from the group consisting of a two-dimensional image and a three dimensional image.

22. (Previously presented) The system of claim 1, wherein the radioactive emission probe images a radioactivity emitting source selected from the group consisting of a radiopharmaceutically labeled benign tumor, a radiopharmaceutically labeled malignant tumor, a radiopharmaceutically labeled vascular clot, radiopharmaceutically labeled inflammation related components, a radiopharmaceutically labeled abscess and a radiopharmaceutically labeled vascular abnormality.

23. (Previously presented) The system of claim 1, wherein the position tracking system is selected from the group consisting of an articulated arm position tracking system, an accelerometer based position tracking system, a potentiometer based position tracking system, a sound wave based position tracking system, a radio frequency based position tracking system, an electromagnetic field based position tracking system, an optical based position tracking system, a position tracking system configured for free-hand movement, and a combination thereof.

24. (Previously Presented) The system of claim 1, wherein the data processor is further configured for calculating a first position of the radioactivity-emitting source in a first system-of-coordinates and projecting the first position onto a second system-of-coordinates.

25. (Previously presented) The system of claim 1, further including a structural imaging modality means in communication with a structural-modality position tracking system, for constructing a structural image of a body component in a structural modality system-of-coordinates, wherein the radioactivity emitting source is a radiopharmaceutically labeled portion of the body component, and wherein the data processor is further configured for constructing the structural image of the body component and the image of the radiopharmaceutically labeled portion of the body component in a common system-of-coordinates.

26. (Previously presented) The system of claim 25, wherein the structural imaging modality means is a two-dimensional imaging modality means.

27. (Previously presented) The system of claim 25, wherein the structural imaging modality means is a three-dimensional imaging modality means.

28. (Previously Presented) The system of claim 25, configured for a visual co-presentation of the body component and the radiopharmaceutically labeled portion of the body component.

29. (Previously presented) The system of claim 25, wherein the structural imaging modality means is selected from the group consisting of a fluoroscope, a computed tomographer, a magnetic resonance imager, an ultrasound imager, an impedance imager, and an optical camera.

30. (Previously presented) The system of claim 1, and further including a structural imaging modality means in communication with the position tracking system, wherein the data processor is further configured for constructing a structural image of the body component and the image of the radioactivity emitting source in a common system-of-coordinates.

31. (Original) The system of claim 1, wherein the radioactive emission probe is an intracorporeal radioactive emission probe.

32. (Previously presented) The system of claim 31, wherein the radioactive emission probe is an intracorporeal radioactive emission probe mounted on a surgical instrument.

33. (Original) The system of claim 32, wherein the surgical instrument is selected from the group consisting of laser probes, cardiac and angioplastic catheters, endoscopic probes, biopsy needles, aspiration tubes or needles, resectoscopes,

resecting devices, ablation devices, high-energy ultrasound ablation devices, tissue sampling devices, ultrasonic probes, fiber optic scopes, laparoscopy probes, thermal probes, suction probes, irrigation probes, and open-surgery devices.

34. (Previously Presented) The system of claim 31, wherein the intracorporeal radioactive emission probe is configured for detecting radiation, selected from the group consisting of gamma radiation, low-energy gamma radiation, beta radiation, positron radiation, and a combination thereof.

35. (Previously Presented) The system of claim 31, configured for visual co-presentation at least of the position of the intracorporeal radioactive emission probe and of the radioactivity-emitting source, wherein the intracorporeal radioactive emission probe may thus be used as a pointing device.

36. (Previously Presented) The system of claim 1, wherein the radioactive emission probe is an extracorporeal radioactive emission probe, and further including a surgical device, in communication with a surgical position tracking system, for tracking the position of the surgical instrument in a surgical-instrument system-of-coordinates, wherein the data processor is further configured for constructing the image of the radioactivity emitting source and the position of the surgical instrument in a common system-of-coordinates.

37. (Original) The system of claim 36, wherein the surgical instrument is selected from the group consisting of laser probes, cardiac and angioplastic catheters, endoscopic probes, biopsy needles, aspiration tubes or needles, resectoscopes, resecting devices, tissue sampling devices, ultrasonic probes, fiber optic scopes, laparoscopy probes, thermal probes, suction probes, irrigation probes, and open-surgery devices.

38. (Original) The system of claim 36, wherein the surgical instrument further includes a surgical-instrument, intracorporeal, radioactive emission probe.

39. (Previously presented) The system of claim 38, wherein the radioactivity emitting source is labeled with a radiopharmaceutical and the radioactive emission probe includes at least one of extracorporeal and intracorporeal radioactive emission probes.

40. (Previously presented) The system of claim 36, further comprising a display for visual co-presentation at least of the position of the extracorporeal radioactive emission probe, the surgical instrument, and the radioactivity-emitting source.

41. (Original) The system of claim 1, and further including a memory unit, for storing the inputs.

42. (Previously Presented) The system of claim 1, wherein the data processor is further configured for refining the inputs.

43. (Currently Amended) A method for defining ~~an~~ a three dimensional (3D) image of a radioactivity emitting source in a system-of-coordinates, the method comprising:

scanning, ~~in a variable course~~ from a plurality of positions~~motion~~ in different planes around the radioactivity emitting source, a radioactivity emitting source with a radioactive emission probe to obtain image data in a first resolution;

monitoring ~~a~~ said plurality of positions ~~position of the a radioactive emission probe,~~ as ~~it~~ said radioactive emission probe scans the radioactivity emitting source;

data processing the image data and the position; and

reconstructing ~~constructing~~ a 3D ~~first~~ image, having a second resolution, of the radioactivity emitting source, by the data processing using a plurality of radiation detections detected during said scanning and the position of the probe ~~during said detections~~ as monitored during said monitoring; and

wherein said second resolution is higher than said first resolution;

wherein said reconstructing is performed iteratively from said plurality of radiation detections according to said plurality of positions.

44. (Original) The method of claim 43, wherein the variable-course motion includes free-hand scanning.

45. (Original) The method of claim 43, wherein the variable-course motion includes motion along a body lumen.

46. (Previously presented) The method of claim 43, wherein the variable-course motion includes endoscopic motion through a trocar valve.

47. (Original) The method of claim 43, wherein the variable-course motion includes motion on a linkage system.

48. (Previously Presented) The method of claim 43, wherein the monitoring takes place at very short time intervals of between 100 and 200 milliseconds.

49. (Previously presented) The method of claim 43, wherein the data processing further includes utilizing wide-aperture collimation-deconvolution algorithms.

50. (Currently Amended) The method of claim 43, wherein the reconstruction ~~construction~~ of the ~~first~~ 3D image is produced by a wide-aperture collimation .

51. (Previously presented) The method of claim 43, wherein scanning a radioactivity emitting source with a radioactive emission probe comprises scanning with a wide-bore-collimator probe and wherein monitoring a position of the radioactive emission probe comprises monitoring a position of the wide-bore-collimator probe.

52. (Previously Presented) The method of claim 43, wherein scanning a radioactivity emitting source with a radioactive emission probe comprises scanning with a wide-angle-collimator probe and wherein monitoring a position of the

radioactive emission probe comprises monitoring a position of the wide-angle collimator probe.

53. (Previously Presented) The method of claim 43, wherein scanning a radioactivity emitting source with a radioactive emission probe comprises scanning with a square collimator probe and wherein monitoring a position of the radioactive emission probe comprises monitoring a position of the square collimator probe.

54. (Previously Presented) The method of claim 43, wherein scanning a radioactivity emitting source with a radioactive emission probe comprises scanning with a radioactive emission probe which includes a single-pixel radiation detector and a single collimator.

55. (Previously Presented) The method of claim 43, wherein scanning a radioactivity emitting source with a radioactive emission probe comprises scanning with a radioactive emission probe which includes a multi-pixel radiation detector and a single collimator.

56. (Previously Presented) The method of claim 43, wherein scanning a radioactivity emitting source with a radioactive emission probe comprises scanning with a grid collimator probe, having a plurality of collimator cells and wherein monitoring a position of the radioactive emission probe comprises monitoring a position of the grid collimator probe.

57. (Previously Presented) The method of claim 56, wherein scanning a radioactivity emitting source with a radioactive emission probe comprises scanning with a grid collimator probe, having a plurality of collimator cells which include a single pixel.

58. (Previously Presented) The method of claim 56, wherein scanning a radioactivity emitting source with a radioactive emission probe comprises scanning

with a grid collimator probe, having a plurality of collimator cells which include a plurality of pixels.

59. (Previously Presented) The method of claim 43, wherein scanning a radioactivity emitting source with a radioactive emission probe comprises scanning with a radioactive emission probe which includes at least two radiation detectors, each with a dedicated collimator.

60. (Previously Presented) The method of claim 43, wherein scanning a radioactivity emitting source with a radioactive emission probe comprises scanning with a radioactive emission probe which includes at least two radiation detectors, each with a dedicated collimator, wherein the dedicated collimators are not parallel to each other.

61. (Currently Amended) The method of claim 43, wherein ~~constructing~~ said reconstructing includes reconstructing ~~constructing~~ the ~~first~~ 3D image in two dimensions.

62. (Currently Amended) The method of claim 43, wherein said reconstructing ~~constructing~~ includes reconstructing ~~constructing~~ the ~~first~~ 3D image in three dimensions.

63. (Currently Amended) The method of claim 43, wherein the data processing further includes calculating a distance between the radioactive emission probe and the radioactivity emitting source, at each position of the probe during said detections as monitored during said monitoring~~monitored position~~, based on a different attenuation of photons of different energies, emitted from the radioactivity emitting source.

64. (Currently Amended) The method of claim 63, wherein said processing includes constructing ~~said~~ an additional ~~second~~ image, by the data processing, based on the distance between the radioactive emission probe and the radioactivity emitting source at each position.

65. (Currently Amended) The method of claim 64, and further including visually co-presenting the ~~first~~ 3D and ~~second~~ additional images on a display screen.

66. (Previously presented) The method of claim 43, wherein scanning a radioactivity emitting source with a radioactive emission probe comprises scanning with a radioactive emission probe which is selected from the group consisting of a narrow-angle radioactive emission probe, a wide-angle radiation emission detector, a plurality of individual narrow angle radiation emission detectors, a spatially sensitive, pixelated, radioactivity detector, a Compton gamma probe, a tube collimator, a detector sensitive to gamma radiation, a detector sensitive to beta radiation, a detector sensitive to positron radiation, a detector sensitive to alpha radiation, and a combination thereof.

67. (Previously presented) The method of claim 43, wherein the radioactive emission probe is operative as a position tracking pointer by following a three dimensional surface which defines body curvatures of a body, to define the position of the radioactivity-emitting source with respect to an outer surface of the body and create a three dimensional map of both the radioactivity-emitting source and the body.

68. (Currently Amended) The method of claim 67, and further including simultaneously visually ~~co-~~presenting the radioactivity-emitting source and the body.

69. (Original) The method of claim 43, wherein the radioactivity emitting source is selected from the group consisting of a radiopharmaceutically labeled benign tumor, a radiopharmaceutically labeled malignant tumor, a radiopharmaceutically labeled vascular clot radiopharmaceutically labeled inflammation related components, a radiopharmaceutically labeled abscess and a radiopharmaceutically labeled vascular abnormality.

70. (Previously Presented) The method of claim 43, wherein monitoring a position of the a radioactive emission probe comprises monitoring with a position tracking

system selected from the group consisting of an articulated arm position tracking system, an accelerometers based position tracking system, a potentiometers based position tracking system, a sound wave based position tracking system, a radio frequency based position tracking system, an electromagnetic field based position tracking system, an optical based position tracking system, a position tracking system configured for free-hand movement, and a combination thereof.

71. (Previously Presented) The method of claim 43, wherein the data processor is further configured for calculating a first position of the radioactivity-emitting source in a first system-of-coordinates and projecting the first position onto a second system-of-coordinates.

72. (Currently Amended) The system ~~method~~ of claim ~~43~~1, and further including

~~performing~~ a structural imaging modality means, with a structural-modality position tracking system, for constructing a structural image of a body component in a structural modality system-of-coordinates,

wherein the radioactivity emitting source is a radiopharmaceutically labeled portion of the body component, and

wherein the data processor is further configured for constructing the structural image of the body component and the image of the radiopharmaceutically labeled portion of the body component in a common system-of-coordinates.

73. (Currently Amended) The method of claim 72, wherein said reconstructing a structural image comprises performing a two-dimensional imaging scan using ~~a~~ the structural imaging modality means.

74. (Currently Amended) The method of claim 72, wherein said reconstructing a structural image comprises performing a three- dimensional imaging scan using a structural imaging modality means.

75. (Currently Amended) The method of claim 72, and further including simultaneously visually ~~co~~-presenting the body component and the

radiopharmaceutically labeled portion of the body component.

76. (Currently Amended) The method of claim 72, wherein said reconstructing a structural image comprises performing a imaging scan using a structural imaging modality means, with a structural-modality position tracking system comprises performing with a structural modality position tracking system selected from the group consisting of a fluoroscope, a computed tomographer, a magnetic resonance imager, an ultrasound imager, an impedance imager, and an optical camera.

77. (Currently Amended) The method of claim ~~43~~1, and further including a structural imaging modality means in communication with the position tracking system, wherein the data processor is further configured for constructing a structural image of the body component and the image of the radioactivity emitting source in a common system-of-coordinates.

78. (Previously Presented) The method of claim 43, wherein scanning a radioactivity emitting source with a radioactive emission probe comprises scanning with an intracorporeal radioactive emission probe.

79. (Previously Presented) The method of claim 43, wherein scanning a radioactivity emitting source with a radioactive emission probe comprises scanning with an intracorporeal radioactive emission probe, mounted on a surgical instrument.

80. (Previously Presented) The method of claim 43, wherein scanning a radioactivity emitting source with a radioactive emission probe comprises scanning with an intracorporeal radioactive emission probe, mounted on a surgical instrument selected from the group consisting of laser probes, cardiac and angioplastic catheters, endoscopic probes, biopsy needles, aspiration tubes or needles, resectoscopes, resecting devices, ablation devices, high-energy ultrasound ablation devices, tissue sampling devices, ultrasonic probes, fiber optic scopes, laparoscopy probes, thermal probes, suction probes, irrigation probes, and open-surgery devices.

81. (Previously presented) The method of claim 78, wherein scanning with an intracorporeal radioactive emission probe comprises scanning with an intracorporeal radioactive emission probe configured for detecting radiation, selected from the group consisting of gamma radiation, low-energy gamma radiation, beta radiation, positron radiation, and a combination thereof.

82. (Previously presented) The method of claim 78, and further including visually co-presenting at least the position of the intracorporeal radioactive emission probe and the position of the radioactivity-emitting source, wherein the intracorporeal radioactive emission probe may thus be used as a pointing device.

83. (Currently Amended) The method of claim 43, wherein the radioactive emission probe is an extracorporeal radioactive emission probe, for tracking position of a surgical instrument in communication with a surgical position tracking system in a surgical-instrument system-of-coordinates, wherein the data processor is further configured for reconstructing ~~constructing~~ the 3D image of the radioactivity emitting source and the position of the surgical instrument in a common system-of-coordinates.

84. (Previously Presented) The method of claim 83, wherein including a surgical device comprises including a surgical instrument selected from the group consisting of laser probes, cardiac and angioplastic catheters, endoscopic probes, biopsy needles, aspiration tubes or needles, resectoscopes, resecting devices, tissue sampling devices, ultrasonic probes, fiber optic scopes, laparoscopy probes, thermal probes, suction probes, irrigation probes, and open-surgery devices.

85. (Previously Presented) The method of claim 83, wherein including a surgical device comprises including a surgical instrument which includes a surgical-instrument, intracorporeal, radioactive emission probe.

86. (Previously Presented) The method of claim 85, wherein scanning a radioactivity emitting source comprises scanning a radioactivity-emitting source

labeled with a radiopharmaceutical, particularly suited for in-tandem operation of extracorporeal and intracorporeal radioactive emission probes.

87. (Previously presented) The method of claim 83, and further including visually co-presenting at least the position of the extracorporeal radioactive emission probe, the surgical instrument, and the radioactivity-emitting source.

88. (Previously Presented) The method of claim 43, and further including storing the data processing in a memory unit.

89. (Previously Presented) The method of claim 43, wherein the data processor is further configured for refining the inputs.

90. (Currently Amended) A method of nuclear imaging, comprising:

scanning a radioactivity emitting source with a radioactive emission probe having a wide-aperture collimator to obtain an image data in a first resolution;

monitoring a plurality of positions ~~position~~ of the radioactive emission probe in different planes around the radioactivity emitting source;

data processing the image data and the position, while mathematically correcting the scanning for ~~the~~ effecting of wide-aperture collimator; and

reconstructing ~~constructing~~ a three dimensional (3D) ~~first~~ image of the radioactivity emitting source in a second resolution by the data processing using a plurality of radiation detections detected during said scanning and the position of the probe ~~during said detections~~ as monitored during said monitoring; and

wherein said second resolution is higher than said first resolution~~.~~;

wherein said reconstructing is performed iteratively from said plurality of radiation detections according to said plurality of positions.

91. (Previously Presented) The method of claim 90, wherein the monitoring takes place at very short time intervals of between 100 and 200 milliseconds.

92. (Previously presented) The method of claim 90, wherein the data processing further includes utilizing wide-aperture collimation-deconvolution algorithms.

93. (Previously Presented) The method of claim 90, wherein scanning a radioactivity emitting source with a radioactive emission probe comprises scanning with a wide-bore-collimator probe.

94. (Previously Presented) The method of claim 90, wherein scanning a radioactivity emitting source with a radioactive emission probe comprises scanning with a wide-angle collimator probe.

95. (Previously Presented) The method of claim 90, wherein scanning a radioactivity emitting source with a radioactive emission probe comprises scanning with a square collimator probe.

96. (Previously Presented) The method of claim 90, wherein scanning a radioactivity emitting source with a radioactive emission probe comprises scanning with a radioactive emission probe which includes a single-pixel radiation detector and a single collimator.

97. (Previously Presented) The method of claim 90, wherein scanning a radioactivity emitting source with a radioactive emission probe comprises scanning with a radioactive emission probe which includes a multi-pixel radiation detector and a single collimator.

98. (Previously Presented) The method of claim 90, wherein scanning a radioactivity emitting source with a radioactive emission probe comprises scanning with a grid collimator probe, having a plurality of collimator cells.

99. (Previously Presented) The method of claim 98, wherein scanning with a grid collimator probe, having a plurality of collimator cells comprises scanning with a grid

collimator probe, having a plurality of collimator cells wherein each of the collimator cells includes a single pixel.

100. (Previously Presented) The method of claim 98, wherein scanning with a grid collimator probe, having a plurality of collimator cells comprises scanning with a grid collimator probe, having a plurality of collimator cells wherein each of the collimator cells includes a plurality of pixels.

101. (Previously Presented) The method of claim 90, wherein scanning a radioactivity emitting source with a radioactive emission probe comprises scanning with a radioactive emission probe including at least two radiation detectors, each with a dedicated collimator.

102. (Previously Presented) The method of claim 101, wherein scanning with a radioactive emission probe including at least two radiation detectors, each with a dedicated collimator comprises scanning with a radioactive emission probe including at least two radiation detectors, each with a dedicated collimator wherein the dedicated collimators are not parallel to each other.

103-104. (Cancelled).

105. (Previously presented) The method of claim 90, wherein the data processing further includes calculating a distance between the radioactive emission probe and the radioactivity emitting source, at each position of the probe during said detections as monitored during said monitoring~~monitored position~~, calculating a distance between the radioactive emission probe and the radioactivity emitting source, at each position of the probe during said detections as monitored during said monitoring~~monitored position~~, based on different attenuation of photons of different energies, emitted from the radioactivity emitting source.

106. (Original) The method of claim 105, and further including constructing an

additional ~~second~~ image of the radioactivity emitting source, by the data processing, based on the distance between the radioactive emission probe and the radioactivity emitting source at each position.

107. (Currently Amended) The method of claim 106, and further including visually co-presenting the ~~first~~ 3D and ~~second~~ additional images on a display screen.

108. (Currently Amended) The method of claim 106, wherein the ~~second~~ additional image is a two dimensional image.

109. (Currently Amended) The method of claim 106, wherein the additional ~~second~~ image is a three dimensional image.

110 - 112. (canceled).

113. (Withdrawn) The method of claim 144, wherein scanning along a surface of the body with a radioactive emission probe comprises scanning with a wide-bore-collimator probe.

114. (Withdrawn) The method of claim 144, wherein scanning along a surface of the body with a radioactive emission probe comprises scanning with a wide-angle collimator probe.

115. (Withdrawn) The method of claim 144, wherein scanning along a surface of the body with a radioactive emission probe comprises scanning with a square collimator probe.

116. (Withdrawn) The method of claim 144, wherein scanning along a surface of the body with a radioactive emission probe comprises scanning with a radioactive emission probe which includes a single-pixel radiation detector and a single collimator.

117. (Withdrawn) The method of claim 144, wherein scanning along a surface of the body with a radioactive emission probe comprises scanning with a radioactive emission probe which includes a multi-pixel radiation detector and a single collimator.

118. (Withdrawn) The method of claim 144, wherein scanning along a surface of the body with a radioactive emission probe comprises scanning with a grid collimator probe, having a plurality of collimator cells.

119. (Withdrawn) The method of claim 118, wherein scanning with a grid collimator probe, having a plurality of collimator cells comprises scanning with a grid collimator probe, having a plurality of collimator cells wherein each of the collimator cells includes a single pixel.

120. (Withdrawn) The method of claim 118, wherein scanning with a grid collimator probe, having a plurality of collimator cells comprises scanning with a grid collimator probe, having a plurality of collimator cells wherein each of the collimator cells includes a plurality of pixels.

121. (Withdrawn) The method of claim 144, wherein scanning along a surface of the body with a radioactive emission probe comprises scanning with a radioactive emission probe includes at least two radiation detectors, each with a dedicated collimator.

122. (Withdrawn) The method of claim 121, wherein scanning with a radioactive emission probe including at least two radiation detectors, each with a dedicated collimator comprises scanning with a radioactive emission probe including at least two radiation detectors, each with a dedicated collimator wherein the dedicated collimators are not parallel to each other.

123. (Currently Amended) A system for reconstructing ~~constructing an~~ a three

dimensional (3D) image of a radioactivity emitting source in a system-of-coordinates, the system comprising:

a radioactive emission probe having a wide-aperture collimator;

a position tracking system, ~~being~~ in communication with the radioactive emission probe and configured for tracking a plurality of positions ~~position~~ of the probe in different planes around the radioactivity emitting source in the system-of-coordinates; and

a data processor, being configured for receiving data inputs from the position tracking system and from the radioactive emission probe and for reconstructing ~~constructing~~ the 3D image of the radioactivity emitting source in the system-of-coordinates using a plurality of radiation detections received from the probe and the position of the probe ~~during said detections~~ as received from the position tracking system;~~.~~

wherein said data processor iteratively reconstructs said 3D image from said plurality of radiation detections according to said plurality of positions.

124. (Previously Presented) The system of claim 123, wherein the radioactive emission probe of a wide-aperture collimator is configured for a variable course motion.

125. (Original) The system of claim 124, wherein the variable-course motion includes free-hand scanning.

126. (Original) The system of claim 124, wherein the variable-course motion includes motion along a body lumen.

127. (Previously Presented) The system of claim 124, wherein the variable-course motion includes endoscopic motion, through a trocar valve.

128. (Original) The system of claim 124, wherein the variable-course motion includes motion on a linkage system.

129. (Previously Presented) The system of claim 123, wherein the radioactive emission probe of a wide-aperture collimator is configured for motion within a predetermined track on an immobile gantry.

130. (Previously Presented) The system of claim 123, wherein the radioactive emission probe of a wide-aperture collimator is configured for motion within at least two predetermined tracks on an immobile gantry.

131. (Previously Presented) The system of claim 123, wherein the radioactive emission probe of a wide-aperture collimator is configured for a system selected from gamma camera and SPECT.

132. (Previously presented) The system of claim 123, wherein the data processor is further configured to utilize an image acquisition and reconstruction algorithm, based on wide-aperture collimation—- deconvolution algorithms, for image resolution enhancement.

133. (Previously Presented) The system of claim 123, wherein the radioactive emission probe comprises a wide-bore-collimator probe.

134. (Previously Presented) The system of claim 123, wherein the radioactive emission probe comprises a wide-angle collimator probe.

135. (Previously Presented) The system of claim 123, wherein the radioactive emission probe comprises a square collimator probe.

136. (Original) The system of claim 123, wherein the radioactive emission probe includes a single-pixel radiation detector and a single collimator.

137. (Original) The system of claim 123, wherein the radioactive emission probe includes a multi-pixel radiation detector and a single collimator.

138. (Previously Presented) The system of claim 123, wherein the radioactive emission probe comprises a grid collimator probe, having a plurality of collimator cells.

139. (Original) The system of claim 138, wherein each of the collimator cells includes a single pixel.

140. (Original) The system of claim 138, wherein each of the collimator cells includes a plurality of pixels.

141. (Original) The system of claim 123, wherein the radioactive emission probe includes at least two radiation detectors, each with a dedicated collimator.

142. (Original) The system of claim 141, wherein the dedicated collimators are not parallel to each other.

143. (Cancelled)

144. (Withdrawn) A method of determining a depth of a radioactivity emitting source, in a body, the method comprising:

administering to the body a radiopharmaceutical, labeled with a radionuclide that emits at least first and second photon energies;

scanning along a surface of the body~~,~~ for the radioactivity emitting source~~,~~ with a radioactive emission probe, tuned for the at least first and second photon energies;

obtaining count rates for the at least first and second photon energies; and

determining depth information of the radioactivity emitting source from the surface of the body, based on different attenuations of the first and second photon energies.

145. (Withdrawn) The method of claim 144, wherein the determining depth information further includes calculating depth information, in accordance with the equation:

d = ln { [I (E.sub.1) / I (E.sub.2)] / [I.sub.0 (E.sub.1) / I.sub.0 (E.sub.2)] } / [.mu.(E.sub.2) - .mu.(E.sub.1)]

wherein:

d is the depth of the radioactivity emitting source from the surface of the body;

I.sub.0 (E.sub.1) / I.sub.0 (E.sub.2) is the ratio of initial intensities of the first and second photon energies, at the radioactivity emitting source;

I (E.sub.1) / I (E.sub.2)is the ratio of intensities of the first and second photon energies, being the count rates for the first and second photon energies, as measured at the surface of the body, by the radioactive emission probe; and

.mu.(E.sub.1) and .mu.(E.sub.2) are the tissue attenuation coefficients for the first and second photon energies, respectively.

146. (Withdrawn) The method of claim 144, wherein the determining depth information further includes determining three dimensional depth information of the radioactivity emitting source.

147. (Withdrawn) The method of claim 144, wherein the radioactive emission probe is associated with a position tracking system, and the method further includes:

monitoring the position of the radioactive emission probe, as it scans;

calculating the depth of the radioactivity emitting source, at each position; and

constructing an image of the radioactivity emitting source, the image being selected from the group consisting of a two dimensional image and a three dimensional image.

148. (Withdrawn) An intracorporeal-imaging head, comprising:

a housing; at least one radioactive-emission probe, supported by said housing, which images radioactive-emission from at least two different viewing angles of a portion of a tissue without changing the position of the housing;

an imaging system configured for imaging said portion; and

a data processor configured for constructing an image using a plurality of radioactive-emission images received from the probe and images received from the imaging system.

149. (Withdrawn) The intracorporeal imaging head of claim 148 wherein the imaging system is one of a fluoroscope, a computed tomographer, a magnetic resonance imager, an ultrasound imager, an impedance imager, and an optical camera.

150. (Withdrawn) The intracorporeal imaging head of claim 148 wherein the at least one radioactive-emission probe is at least one wide-angle collimator probe.

151. (Withdrawn) The intracorporeal imaging head of claim 150 wherein the wide-angle collimator probe has a viewing angle of between 81° and 280°.

152. (Withdrawn) An intracorporeal-imaging head, comprising:

a housing, sized and shaped for intracorporeal-imaging; at least one radioactive-emission probe mounted on said housing, said at least one radioactive-emission probe images radioactive-emission from at least two different viewing angles of a portion of a tissue without changing the position of the housing; and

a position tracking system in a fixed positional relation with said at least one radioactive-emission probe, for providing positional information for said at least one radioactive-emission probe; and

a data processor configured for constructing an image using a plurality of images received from the probe and the position of the probe during the imaging of said images as received from the position tracking system.

153. (Withdrawn) The intracorporeal imaging head of claim 152 wherein the position tracking system is one of a fluoroscope, a computed tomographer, a magnetic resonance imager, an ultrasound imager, an impedance imager, and an optical camera.

154. (Withdrawn) The intracorporeal imaging head of claim 152 wherein the position tracking system is configured for tracking acoustic electromagnetic radiation or magnetic fields.

155. (Withdrawn) The intracorporeal imaging head of claim 152 wherein the at least one radioactive-emission probe is at least one wide-angle collimator probe.

156. (Withdrawn) The intracorporeal imaging head of claim 155 wherein the wide-angle collimator probe has a viewing angle of between 81° and 280°.

157. (Withdrawn) A flexible probe, comprising:

an intracorporeal imaging head according to claim 152; and

an ultrasonic imager sized for rectal insertion for imaging of prostate.

158. (Withdrawn) A flexible probe, comprising:

an intracorporeal imaging head according to claim 152; and

an optical imager sized for rectal insertion for imaging of colon.

159. (Currently Amended) A system according to claim 1, wherein the data processor being configured ~~r tomographicly~~topographically reconstruct an image.

160. (Currently Amended) A method according to claim 43 wherein said reconstructing ~~constructing a first image~~ comprises tomographically reconstructing a ~~first~~ 3D image.

161. (Currently Amended) A method according to claim 90 wherein said reconstructing ~~constructing~~ a first image comprises reconstructing ~~constructing~~ a first image using a deconvolution algorithm.

162. (Currently Amended) A system according to claim 123, wherein the data processor ~~being configured to~~ reconstructs ~~construct an~~ the image using a deconvolution algorithm.

163. (Withdrawn) An imaging head according to claim 148, wherein the data processor is configured for constructing the image wherein the intensity of the image is a function of time intervals between the plurality of images received from the probe.

164. (Withdrawn) An imaging head according to claim 152, wherein the data processor is configured for constructing the image wherein the intensity of the image is a function of time intervals between the plurality of images received from the probe.